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DISCUSSION

RICHARD J. HERRING*: Forward exchange rates predict subsequent spot exchange rates very badly. Forecast errors are often of roughly the same magnitude as actual changes in exchange rates. Moreover, recent evidence indicates that forward rates are also biased predictors. Why forward rates predict so badly is of considerable academic interest. Whether and how the forecast errors can be reduced is of obvious practical importance. Logue and Sweeney (L&S) propose a new approach to these problems.

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Most researchers have confronted the problem directly by focusing on the difference between f, (the natural log of) the forward exchange rate and s_t, (the natural log of) the subsequent, realized spot exchange rate. L&S note that the problem can be approached in another way. Because the forward exchange rate is at interest parity with respect to the Eurocurrency interest rates, it may be restated as: $f = i - i^* + s$, where i and i^* are (the natural log of one plus) the Eurocurrency interest rate for deposits denominated in the domestic and foreign currency respectively, and s is the (natural log of) the contemporaneous spot rate. The interest parity relationship allows us to reformulate the problem by asking why Eurocurrency differentials predict exchange rate changes so badly? Forecast errors may arise because of errors in forecasting relative inflation rates at home and abroad, e^N, or because of errors in forecasting real variables, e^R, or because the forward exchange rate differs from the expected future spot exchange rate by a risk premium, ρ, that may vary over time. It is clear that whichever way the question is posed, the answer must be the same:

$$(i - i^*) - (s_t - s) = f - s_t = e^N + e^R + \rho. \tag{1}$$

L&S argue that focusing on interest differentials can bring us "a step closer to explaining why forward exchange rates are unreliable predictors of ... spot exchange rates," but the difficulty with either approach is that none of the components of the forecast error is observable. My colleagues Stephen Meyer and Richard Startz (1) have reported results indicating that nearly all of the variance in forecast errors is attributable to the real component; unanticipated fluctuations in relative rates of inflation explain only a minor portion of the variance in forecast errors. Unfortunately their technique cannot separate the risk premium from other components of the forecast error.

L&S emphasize differences in term premia as the chief cause of forecast errors, but the usefulness of their conjecture depends on whether the difference in term premia can be measured more readily than the risk premium in the forward rate. It is not obvious that this is the case. Both measurements depend on comparing an observable rate with an unobservable, expected rate.

One can find at least three different approaches to measuring term premia in the literature on the term structure of interest rates. Term premia have been measured as: (1) the amount by which the return from holding a n-period instrument for one period differs from the one period rate; (2) the amount by which the return from holding a n-period instrument to maturity differs from the return from rolling over a sequence of one-period instruments for n-periods; and (3) the amount by which the forward interest rate imbedded in the term-structure of interest rates differs from the corresponding, realized one-period rate. None of these approaches is adequate, however, when term premia vary over time.

L&S propose a new way of measuring term premia. They apply principal components analysis to the term structure of interest rates. The technique provides a parsimonious statistical explanation of their term structure—a one month rate, three month rate, six month rate and one year rate. The principal components technique enables L&S to explain statistically interest rate movements with only two variables—two principal components constructed from the

four interest rates. Although L&S identify the first principal component as a general market factor and the second as the term premium factor, it is not clear that one can make a valid economic interpretation of their statistical explanation. Because they do not define what they mean by "term premia" I am not sure why L&S associate the second principal component with term premia; but, I am doubtful that their second principal component has much relationship to what is normally meant by the concept. My skepticism is based on three observations.

First, L&S appear to have dealt with the challenge of accounting for expected future interest rates, the key issue in most previous research on the term structure, by ignoring it. If the long-term rate is higher than the short-term rate because interest rates are expected to rise, most economists would be reluctant to characterize the difference between the long-term rate and the short-term rate as a term premium. I assume that Logue and Sweeney share this view; but, their approach does not take expectations into account.

Second, L&S have stated the interest rate data in such a way that their technique may identify a factor that varies directly with maturity even if none exists. Yields on short maturity instruments are systematically understated in comparison to yields on long-maturity instruments. Following market practice, L&S analyze annualized data in which annual yields are computed by multiplying actual yields by the quotient of 360 days divided by the maturity of the instrument. The consequent bias is apparent from the following example. Suppose the term structure analyzed by L&S were flat at 24% for each maturity. The corresponding annualized yields for one, three, six and twelve month instruments stated on a compound basis would be 26.8%, 26.2%, 25.4% and 24% respectively. Although the assumption that yields can be compounded at current rates is debatable, the implicit assumption made by L&S, that short-term instruments are rolled over at systematically lower yields, is much less plausible. Since the computation of principal components is sensitive to the way in which variables are measured, this may have an important impact on the results L&S report.

Third, principal components are constructed so that each successive principal component is orthogonal to all the preceding principal components. L&S do not, however, advance any reason that the factors that determine the term premium should be uncorrelated with the other factors that determine the level of interest rates. Indeed, previous investigators have found that term premia vary with the level of interest rates.

Although I believe that term premia partly explain the poor performance of the forward rate in forecasting the spot rate, I have qualms about the way in which L&S reach this conclusion. I am troubled by their disregard of expectations. I have misgivings about the way in which they have annualized the interest rate data; but most importantly, I think that the path they have forged cannot lead to an answer to the question they pose. As Gertrude Stein observed, there is no there, there.

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